ADDENDUM NO. ONE

to

BID DOCUMENTS, CONTRACT DOCUMENTS,
CONSTRUCTION SPECIFICATIONS AND DRAWINGS

for
ADDITIONS TO THE MUD CREEK WATER POLLUTION CONTROL PLANT

for the

CITY OF VALDOSTA, GEORGIA

PROJECT NO. 232633

REVISED BID DATE: Bids Received Until Thursday, May 28, 2026 @ 2:00 p.m.

ACKNOWLEDGE RECEIPT OF THIS ADDENDUM BY INSERTING ITS NUMBER IN THE PROPOSAL. FAILURE TO DO SO MAY SUBJECT BONA FIDE BIDDERS TO DISQUALIFICATION. THIS ADDENDUM FORMS A PART OF THE PROJECT DOCUMENTS; IT MODIFIES THEM AS FOLLOWS:

May 1, 2026

TURNIPSEED ENGINEERS

Atlanta ▪ 2255 Cumberland Parkway ▪ Building 400 ▪ Atlanta, Georgia 30339 ▪ Tel: 770-333-0700
Augusta ▪ 4210 Columbia Road ▪ Building 3 ▪ Augusta, Georgia 30907 ▪ Tel: 706-863-8800

BID DOCUMENTS

Refer to Advertisement, Page 00 11 13 - 1 of 2

Revise the first paragraph to say:

> *"Bids for the construction of the Project will be received at the Engineering Department at 300 N Lee St, Valdosta, GA 31601 until May 28, 2026 at 2:00 PM …"*

Refer to section 00 41 00 Proposal:

Replace the Proposal Form pages 2-6 with the pages attached.

TECHNICAL SPECIFICATIONS

Add the following: Section 01 23 00 - Alternates

Replace Section 25 00 10 – Application Engineering Services with the revised section attached.

Refer to Section 25 00 20 - Panels.

Replace the table in section 1.04.B with the following:

LCP No.	**Location**	**Notes**
SCADA RIO-1	Proposed Alum/Micro-C Chemical Building	Nema 4X Stainless Steel (Corrosion Resistance
SCADA RIO-2	Existing Powerhouse #2	Nema 12 (Interior)
SCADA RIO-3	Proposed Sodium Aluminate Chemical Building	Nema 4X Stainless Steel (Corrosion Resistance)

Refer to Section 43 11 05 – High Speed Turbo Blowers

Add the following to paragraph 1.01.A: *"…sound enclosure, motors, variable frequency drives,* **integrated air conditioned unit**, *control panels…"*

Change the reference in paragraph 1.03.B.4 to Article 1.03.B.1 – 3.

Change the reference in paragraph 1.03.D.3 to 1.04.A-B.

Revise section 2.01.A "Design Discharge Pressure (psig)" to 10.2

Revise section 2.01.B Table 2 Design Point 2 to Inlet Temperature 68 Deg. F.

Replace paragraph 2.03.D with the following:

The currently designed blower system layout is based on blowers equipped with an integrated air-conditioned unit that do not require separate exhaust connections for ventilation of cooling air. Blowers shall allow heat generated by the air-conditioned unit to be exhausted into the blower room. Blower and integral VFD shall not require any external cooling devices such as cooling fans, ducting, or external glycol cooling.

Replace paragraph 2.03.E with the following:

The Blower shall be cooled by an integrated air-conditioned unit and/or an internal closed loop water glycol system. No external cooling provisions shall be permitted.

Delete paragraph 2.04.F

Add the following as section 2.11:

2.11 CABINET AIR CONDITIONING UNITS

A Each blower enclosure shall be provided with an air conditioning unit sized to allow the blower package to deliver design capacity, any time of the day for the climatic conditions specified in this Section.

B Air conditioning units shall both cool and dehumidify the cabinet's internal air. Each air conditioner shall be sized to handle current and future (with specified spare capacity filled) heat loadings from all equipment mounted inside the cabinet.

C Air conditioners shall be provided with thermostats which operate the blowers continuously to prevent stratification of air within the cabinet. Compressors shall operate as needed to maintain the temperature set at the thermostat.

D Ambient air shall be completely separated from the air inside the cabinet. All air conditioner components exposed to the atmosphere outside the cabinets shall be coated to prevent corrosion.

E Air conditioner enclosures shall be made of the same material as the blower enclosure.

Replace section 3.08.A.1.c with the following:

c. The existing zones will utilize the existing DO probes and SC1000 controller. New DO probes and controllers as shown on the Drawings.

1) Three new DO probes will be required in each new East Basin trains for a total of six (6) total to control the new basin.

Replace section 3.08.A.2.a with the following:

a. Air Flow Meters shall be manufactured by FCI or Sierra

1) Air Flow Meters shall include transmitters with 4-20 mA output

2) Air Flow Meters shall include mounting hardware

3) No alternate manufacturers shall be accepted

Re-number section 3.09.A to 3.10.A "INSTRUMENTS"

Replace section 4.01.D.3.a-d with the following:

a. Equipment installation review and startup– eight (8) day in two (2) trips
b. Training of OWNER's personnel – two (2) days in one (1) trip
c. Operation review (6 months later) – two (2) days in one (1) trip
d. Aeration System Start-up and optimization - ten (10) days in two (2) trips

Refer to Section 43 25 13 Submersible Centrifugal Pumps:

Replace the table in section 2.02.A with the following:

Location	Quantity	Flow (gpm)	TDH (ft)	Static Head (ft)	HP	Maximum Speed (rpm)
FOG pumps	2	120	31.2	12.7	3.9	1,755

Refer to Section 43 41 43 Polyethylene Tanks:

Add section 2.05.A.2 "PAC Storage Tank":

3. PAC Storage Tank

a. 6,000 gallon
b. Chemical Composition
    1) PAC 50% Solution 1.26 specific gravity.
c. Heat traced and insulated
d. Fitting Material: PVC
e. Gasket Material: EPDM
f. Bolt Material 316SS
g. Fittings
    1) 4" vent
    2) 3" nozzle flange mounted on top for liquid level
    3) 2" nozzle mounted on top for fill pipe
    4) 3" screened overflow

5) 3” side bottom drain w/ bellows transition fitting

6) 18” I.D. manway on top

Replace section 2.06.A with the following:

A. Ultrasonic Level Indicator: The ultrasonic level indicator shall be a Flowline ultrasonic level transmitter (LU20), level controller (Dataloop LI24-1211) with one 4-20 mA or 0-10 VDC continuous level input and 2 SPST relays, NEMA 4X box (LM92-1002) to be supplied by tank manufacturer.

Refer to section 46 33 00 Metering Pumps

Revise section 1.06.A.6 “Pump Capacity” in the Process Schedule as follows:

Pump Capacity
1) PACl 0.001 GPH – 5.3 GPH 2) Liquidized Carbon – 0.001 GPH – 15.8 GPH 3) Sodium Aluminate – 0.001 GPH – 15.8 GPH
1) PACl 1.9 GPH (West 1) 1.9 GPH (West 2) 6.5 (East 1 &2) 2) Liquidized Carbon –0.9 GPH 3) Sodium Aluminate – 6.8 GPH

Replace section 1.06.A.7.13 with the following:

13) Drive motor: brushless DC motor with integral gearbox and closed loop tachometer feedback.

a) Circuitry complete with temperature and load compensation and protection.

1. Remote Control I/O

i. Speed Control Input: Analog 4-20mA speed input with 1,600:1 turndown with incremental steps of 10 microamps. Signal shall be trimmable and speed scaleable over any part of the drive speed range. Pump shall be programmable to either increase pump speed or decrease pump speed against an increasing Analog 4-20 mA signal.

ii. Run/Stop Input: Either 5-24V industrial logic, dry contact or powered 110 VAC contacts as shown per the process and instrumentation drawings.
iii. Run/Stop & General Alarm Status Outputs: Either 24VDC Open Collector, 24VDC Status relay, or 110VAC Status Relay

Delete section 1.07. This information is contained in section 43 41 13 “Welded Steel Tanks” and 43 41 43 “Polyethylene Tanks”

Delete paragraphs 1.08.D – E.

END OF ADDENDUM NO. ONE

CITY OF VALDOSTA, GEORGIA
MUD CREEK WATER POLLUTION CONTROL PLANT IMPROVEMENTS

For furnishing all materials and equipment and performing all labor necessary for the modifications to the Mud Creek Water Pollution Control Plant as shown on the Drawings and as specified for the following prices and approximate quantities shown.

Item 1: For furnishing all materials and equipment and performing all labor necessary for construction of the Water Pollution Control Plant Improvements, including conversion of existing treatment basins, addition of new treatment structures, digester, solids handling additions, interconnected piping, equipment, grading, site works, erosion control, demolition, renovation, excavation, backfill, structures, piping, drains, and appurtenances, electrical, mechanical (excluding cost of Major Mechanical Equipment listed in Item 2), painting, and all other work and appurtenances for completion of work as shown on the Drawings and/or specified, the lump sum of:

_____ DOLLARS $ _____

Item 2: MECHANICAL EQUIPMENT

Equipment and Manufacturer	**Price**	**Base Price**
a. Dewatered Sludge Conveyance Equipment (Section 11 82 16)		
Mfr. _____		
Mfr. _____		
b. High Speed Turbo Blowers (Section 43 11 05)		
Mfr. _____		
Mfr. _____		
c. Vertical Dry-Pit Submersible Centrifugal Pumps (Section 43 23 13)		
Mfr. _____		
Mfr. _____		
d. Submersible Centrifugal Pumps (Section 43 25 13)		
Mfr. _____		
Mfr. _____		
e. Welded Steel Tanks (Section 43 41 13)		
Mfr. _____		
Mfr. _____		
f. Polyethylene Tanks (Section 43 41 43)		
Mfr. _____		
Mfr. _____		
g. Metering Pumps, Skids & Tanks (Section 46 33 00)		
Mfr. _____		
Mfr. _____		

Equipment and Manufacturer		Price	Base Price
h. Large Bubble Mixing System (Section 46 41 05)			
Mfr.			
Mfr.			
i. Fine Bubble Aeration (Section 46 51 33)			
Mfr.			
Mfr.			
j. SCADA System (Section 25 00 00)			$270,000.00
Mfr.	Electronic Machine Control	$270,000.00	
*Allowance in accordance with spec section 25 00 00 and EMC Proposal in Appenix B.			
k. High Speed Turbo Blowers (Section 43 11 05 - Digester Blowers)			
Mfr.			
Mfr.			
l. Reciprocating Positive Displacement Pumps (Section 43 23 09)			
Mfr.			
Mfr.			
m. Submersible Mixers (Section 46 41 23)			
Mfr.			
Mfr.			
n. Prestressed Concrete Tank (Section 33 36 32)			
Mfr.			
Mfr.			

SUBTOTAL, ITEM 2 INCLUSIVE, THE AMOUNT OF: $

BID ALLOWANCES

Item No.	*Qty.*	*Unit*	*Description*	*Unit Price*	*Total Price*
3.			SOIL EROSION CONTROL DEVICES		
a.	3,125	LF	Silt Fence (Type Sd-1c)		
b.	15	EA	Curb Inlet Protection (Sd2-P)		
c.	20	CY	Riprap (Ch-Rp)		
d.	1	LS	Grassing of Disturbed Areas		
4.			STORMWATER MONITORING		
a.	1	EA	Monitoring Site (establish, construct and operate all sites)		
b.	2	EA	Sampling Events		
5.	1	LS	SPARE PARTS ALLOWANCE	$10,000.00	$10,000.00

SUBTOTAL, ITEMS 3-5 INCLUSIVE, THE AMOUNT OF: $

EXTRA WORK, IF ORDERED BY ENGINEER

Item No.	*Qty.*	*Unit*	*Description*	*Unit Price*	*Total Price*
6.	100	CY	REMOVAL AND DISPOSAL OF SAND, GRIT AND DEBRIS FROM EXISTING TREATMENT UNITS		
7.			EXCAVATION AND BACKFILL		
a.	100	CY	Hand, Dry		
b.	100	CY	Hand, Wet and Dewatering		
c.	100	CY	Machine, Dry		
d.	100	CY	Machine, Wet and Dewatering		
e.	400	CY	No. 57 Stone Stabilization (including undercutting and removal of unsuitable soils, backfilling with stone and geotextile fabric)		

Item No.	*Qty.*	*Unit*	*Description*	*Unit Price*	*Total Price*
8.			CONCRETE WORK		
a.	10	CY	Class "A" Concrete		
b.	10	CY	Class "B" Concrete		
c.	10	CY	Class "C" Concrete		
d.	500	LBS	Reinforcing Steel		
e.	100	SF	Contact Forms		
9.			PLANT SEWER LINES		
a.	20	LF	6" Ductile Iron Pipe		
b.	20	LF	8" Ductile Iron Pipe		
c.	20	LF	10" Ductile Iron Pipe		
10.			DUCTILE IRON PIPE, IN PLACE (FLANGED JOINT)		
a.	10	LF	4" Ductile Iron Pipe		
b.	10	LF	6" Ductile Iron Pipe		
c.	10	LF	8" Ductile Iron Pipe		
d.	10	LF	10" Ductile Iron Pipe		
e.	10	LF	12" Ductile Iron Pipe		
11.			DUCTILE IRON PIPE, IN PLACE (PUSH ON TYPE)		
a.	10	LF	4" Ductile Iron Pipe		
b.	10	LF	6" Ductile Iron Pipe		
c.	10	LF	8" Ductile Iron Pipe		
d.	10	LF	10" Ductile Iron Pipe		
e.	10	LF	12" Ductile Iron Pipe		
f.	10	LF	16" Ductile Iron Pipe		
g.	10	LF	18" Ductile Iron Pipe		
h.	10	LF	24" Ductile Iron Pipe		

Item No.	*Qty.*	*Unit*	*Description*	*Unit Price*	*Total Price*
12.			DUCTILE IRON PIPE FITTINGS		
a.	0.2	Tons	Bell and Spigot		
b.	0.2	Tons	Mechanical Joint		
c.	0.2	Tons	Flanges		

Item No.	*Qty.*	*Unit*	*Description*	*Unit Price*	*Total Price*
13.			ROADWAYS AND PAVING		
a.	25	SY	1½" Mill and Replace: 12.5 MM (165#/SY) Superpave Asphalt Paving		
b.	12.5	SY	Heavy Duty Asphalt Paving: 1.5" 12.5 MM(165#/SY) and 3" 19 MM (330#/SY) Superpave including 8" GAB		

SUBTOTAL, ITEMS 6-13 INCLUSIVE, THE AMOUNT OF: $

TOTAL AMOUNT BID, ITEMS 1 THROUGH 13, INCLUSIVE, THE AMOUNT OF:

DOLLARS $

ADDITIONS/DEDUCTIONS

Note: The Owner reserves the right to add any or all of the following additions/deductions of the work for the purpose of making contract award. Award of the contract may be with one or more of these items. Each Bidder must fill in the unit price amount for each item below in accordance with Section 01 23 00.

A-1 For furnishing all materials and equipment and performing all labor necessary for construction of the Digester in a new cast-in-place concrete tank, (excluding cost of all excavation, fills, piping, electrical, demolition, other structures, and the work included in Item 1 Base Bid, and Major Mechanical Equipment listed in Item 2 above), and all other work and appurtenances for completion of work as shown on the Drawings and/or specified herein, **add** or **deduct** (circle one) the follwoing amount:

DOLLARS $

SUBSTITUTE EQUIPMENT

The Bidder may offer at his own option the bid price and name of other makes of equipment which he desires to substitute for specified equipment designated by him in Parts 1 and 2, Item 2 of the Proposal. The Bidder is referred to Section 01 25 00 of these specifications for "Substitution Procedures" required.

Item		Equipment & Manufacturer	Price	Base Price
	Mfr.			
	Mfr.			
	Mfr.			
	Mfr.			

NOTE: The Owner reserves the right to select any item of equipment bid upon as a basis to award contract.

The Bidder further proposes and agrees hereby to commence work under contract, with adequate force and equipment, on a date to be specified in a written order of the Engineer, and shall fully complete all work thereunder within the number of consecutive calendar days setforth in the Contract Agreement.

SECTION 01 23 00

ALTERNATES

PART 1 - GENERAL

1.01 SUMMARY

A. This Section governs the definition, pricing, coordination, and acceptance of Bid Alternates.

B. Definition. A Bid Alternate is an amount stated on the Bid Form for specifically described Work that may be added to or deducted from the Base Bid at the Owner's option. Alternates may modify the quantity of Work, or the products, materials, equipment, systems, or methods of construction described in the Contract Documents.

C. Coordination. The Bidder shall coordinate all Work associated with each Alternate and adjust adjacent or related Work as required to provide a complete, operable, and fully integrated installation.

D. Included Work. Each Alternate shall include all labor, materials, equipment, accessories, incidentals, and services necessary for complete execution of the Alternate scope, whether or not each such item is explicitly identified.

E. Pricing.

1. Bid Alternates shall be quoted as all-inclusive additive or deductive amounts.

2. Prices shall include all direct and indirect costs, markups, overhead, and fees associated with the Work added or deleted.

3. Prices shall reflect all Work required to fully implement the applicable Alternate scope as defined in the Contract Documents.

F. Owner's Rights.

1. The Owner reserves the right to accept or reject any Bid Alternate, individually or in any combination.

2. The Owner may exercise any accepted Bid Alternate by Change Order, at the prices stated on the Bid Form (Section 00 41 00).

G. Contract Time. Acceptance or rejection of any Bid Alternate shall not modify the Contract Times, including the Date of Substantial Completion or the Date of Final Completion.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 SCHEDULE OF ALTERNATES

A. The Bidder shall determine from the Bid and Contract Documents the complete scope of each Bid Alternate identified below, including all required associated Work necessary for proper execution

B. Bid Alternates

Alternate No. 1 – This price will include constructing the Digester using poured in place concrete in lieu of a prestressed concrete tank. The total price will NOT include interconnected piping, grading, site works, erosion control, demolition, excavation, backfill, structures, piping, drains, and appurtenances, electrical, mechanical equipment (pricing as shown Item 2 Major Mechanical Equipment), or painting, but SHALL include all other work including forms, ties, rebar, and appurtenances for completion of work as shown on the Drawings titled Alternate Aerobic Digester and/or specified herein.

C. Dollar Amount

The dollar amount entry line on the proposal shall contain the absolute value of the difference in cost between the base bid, Aerobic Digester in Prestressed Tank and Alternate No. 1 – Aerobic Digester in Cast-In-Place tank. The bidder will circle “add” or “deduct” to indicate whether the amount entered will add or subtract from the bid price if accepted.

END OF SECTION

SECTION 25 00 10

APPLICATION ENGINEERING SERVICES

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The General Provisions of Section 25 00 00 shall apply to this section.

B. All work in this Section shall be the product of the Process Instrumentation and Control Supplier (PICS). Sub-suppliers and/or manufacturers may provide components, and/or services to the PICS, but the final product shall conform to this specification and shall be the sole responsibility of the PICS.

C. The PICS shall provide all applications programming and services required to achieve a fully integrated and operational system. The PICS shall coordinate the control system for proper operation with related equipment and materials furnished by other suppliers under other sections of these Specifications and with related existing equipment.

D. Auxiliary and accessory programming structures necessary for system operation or performance shall be included whether or not they are specified or shown on the Contract Drawings.

E. All equipment shall be controlled in full conformity with the Specifications, Drawings, engineering data, instructions and recommendations of the equipment manufacturer.

F. To facilitate the Owner’s future operation and maintenance requirements, all programming and operator interface development shall utilize standards as agreed upon by the Owner and Engineer.

1. The PICS shall coordinate and schedule all testing procedures with the General Contractor.

2. Refer to electrical and instrumentation drawings for I/O requirements.

1.02 RELATED WORK

A. Refer to Section 25 00 00.

B. Refer to Section 25 00 20

1.03 SUBMITTALS

A. Refer to Section 25 00 00.

B. Submittals listed below shall be provided, as a minimum. Each submittal must be complete in order to be reviewed by the Engineer.

1. Field Instruments Submittal

2. Control Panel Drawings Submittal

3. Control Narrative Submittal

4. Graphics Submittal

1.04 SYSTEM DESCRIPTION

A. The PICS is responsible for providing all applications programming and configuration services to accomplish the control and monitoring functions described in the Specifications and Contract Drawings. The PICS shall provide all programming functions. The PICS shall also provide all application programming and configuration services necessary to produce the HMI graphic displays, reports, trends, historical archive, etc. as described in the Specifications and Contract Drawings.

B. PICS shall develop and provide customized graphics to replace, modify or create screens within the existing VTSCADA application. Customized graphic displays (not including standard trends, pop-up windows, HMI supplied displays, etc.) to illustrate the modified plant process control systems. All graphic displays shall be designed by the PICS utilizing the HMI software and shall be approved by the Engineer/Owner. These displays shall be prepared and submitted for review. The PICS shall provide the following list of displays as a minimum:

1. Modify overall view to incorporate new devices.

2. New SCADA Screen for Anerobic Basin Instruments or add to Headworks

3. Modify Existing SCADA Aeration Basin Screens for New Instruments

4. Modify Existing IR pumps to show speed reference

5. New SCADA Screen for New Aeration Basin

6. New SCADA Screen for New Digester (2 Blowers, 2 sludge pumps, 1 mixer)

7. New SCADA Screen for Micro-C Feed system

8. New SCADA Screen for Alum Feed System

9. New SCADA Screen for Sodium Aluminate Feed System

10. New SCADA Screen for Valve Mixing System

1.05 PROGRAMMING AND CONFIGURATION GUIDELINES AND DELIVERABLES

A. Real Variables Processing

1. Real variables shall represent process data for which there are analog signal inputs to the system. The system shall sample each of these input signals at the selected scan frequency and perform the proper conversions and scaling to obtain the instantaneous engineering values. These values shall be used to update real-time data on HMI displays, check for alarm conditions and store for use in historical files.

2. The instantaneous values of all variable data shall be displayed on the appropriate HMI display and shall be added to the historical database whenever the present value exceeds a preprogrammed compression dead band. The compression dead band will be field adjusted by the PICS to provide for maximum storage utilization.

3. Variables such as rate of flow, weight and kilowatt usage shall have their instantaneous values integrated with respect to time and their quantities totaled before archiving.

4. Alarm conditions shall be stored in a separate historical file. In addition, the last 500 alarms shall be displayed on the alarm graphic display. The alarm storage format shall be an alarm description, true time of occurrence, and tag number.

B. Manual Input Data Handling

1. The application software shall provide the capability to manually enter data from any operator's computer keyboard. This data shall consist of additional values for the current data file (e.g., laboratory analyses), inserting alarm limits, set point changes, adjustment to process constants, control system set point changes and system tuning parameter adjustments.

2. All manually entered data shall be entered and stored in the appropriate engineering units. All data entered shall be displayed for confirmation on the data entry device prior to incorporation to the database.

C. HMI Graphic Displays

1. All displays shall contain and continuously update the displayed process variables, date and time of day. All process values shall be displayed in engineering units. All displays shall incorporate references to both instrumentation tag numbers and plant equipment numbers.

2. The HMI displays shall make maximum use of the colors available. Color for status such as open/close, start/stop shall be the same as the indicators used on the existing process control system. PICS shall have designated colors for Raw Water, Process Water, Waste, Backwash, etc. All colors shall be approved by the Owner.

3. The HMI displays shall be interlinked for easy and direct operator call up. They shall be available for viewing be either entering the display name (via keyboard) or via a "hot spot" on the current display screen (mouse driven cursor movement and pick button). All displays shall have "hot spots' for, at a minimum, the Alarm Summary display, Plant Overview Menu display and the Summary Menu display.

4. The system shall allow the operator to manually control the status of pumps, valves, etc. via either keyboard entry or the currently displayed graphic display. The status change shall require a secondary acknowledgement (action confirmation) by the operator before the command is processed.

5. Unless specifically noted, all timers, set points, alarm actuation levels, etc. shall be operator adjustable from the HMI, subject to Owner-defined user access and privileges.

6. Menu displays shall be provided as a guide to the available display options. The menu displays shall be a complete and logical listing of the names and number of all displays.

7. Graphic displays shall depict basic process schematic diagrams with representative symbols for pumps, tanks, etc. combined with real time process variables or conditions. The equipment represented on the display shall be suitably titled for identity. The displays shall be dynamic (i.e., symbols for a pump shall change color indicating run or stop or alarm, the volume of tanks shall be indicated by varying the height of the interior color of the tank symbol, etc.). Its name and tag number shall identify the data on the display. All of

the current data in the database shall be available for graphic displays. It shall be possible to easily modify an existing display or generate a new display. The graphic displays shall consist of a single master plant flow schematic and multiple sub-displays detailing specific plant systems or elements. The process graphic displays shall consist of Master, Area and System displays. The Master and Area displays shall show general graphic representations of the facility covered with general equipment, alarm, analytical summaries and control capabilities. The System display shall detail all relevant aspects of the individual equipment or system (i.e., an individual pump). The intent is to provide the operator with an overview (Master) with the capability of "zooming in" on a process (Area) or a piece of equipment (System) as necessary. The PICS shall use the Instrumentation and Piping Diagrams as part of this Contract to generate the graphic displays. All process variables shall be displayed on their associated display (s) in engineering units. The Engineer/Owner shall approve color standards for the equipment symbols, process piping, etc.

8. Analog trend displays shall display the value of a minimum of eight (8) assigned points versus time. The intent is to depict the type of plot produced on an analog recorder on the HMI display. Each point shall be trended in a different color. Each of the assigned points shall have a point identification number, point name, point description, current value and instrument range display in the color used for its trend. The time period shall be selected and be either current or historical. The time period selected and time and date of start shall be displayed. The values displayed on a historical trend shall consist of the stored values for each variable trended. Current trends shall be updated at the scan frequency of the variable. A trend display shall not be considered a graphic display.

9. Manual laboratory data summary displays shall consist of all laboratory inputs, displaying the tag numbers, tag name, the current value and the date and time that the value was entered.

10. Alarm summary displays shall consist of all points currently in alarm and shall include the tag number, description, true time of occurrence and present status, (high, low, normal, etc.). The alarm summary shall identify alarm points by severity (event, attention, caution and urgent) by utilizing distinct colors for each severity category. The severity classification shall be easily changeable by the Owner.

11. System status displays shall summarize the error status of all system devices capable of reporting errors to the CPU (i.e., printers, communication devices, etc.). The display shall indicate if an error is detected or a failure occurs. It shall also allow assignment of those items capable of acting as back up to other devices. These displays shall be used primarily for maintenance purposes.

12. Single point configuration / status displays shall be of the HMI software manufacturer's standard format.

    a. Where data is pulled from vendor furnished control panels (Remineralization System, Chemical Metering Pumps, Flow Controllers, etc.) via Modbus TCP/IP. In general, the PICS shall display all available data from the vendors processor on the Owner's HMI screen regardless of what is shown on the P&ID drawings. PICS shall coordinate map address points with vendors.

13. Alarm / Equipment Status Reporting

    a. The alarm log shall display all alarms as they occur. The alarm message shall include the time occurrence, tag name, tag number and whether it is a low, high or failure alarm. When the point in alarm returns to normal, the time, point identification number and

"return to normal" shall be displayed. All reports shall include the plant equipment number of the associated device.

b. Equipment status shall be logged whenever a change in status occurs (i.e., start, stop). The status monitoring shall be capable of being disabled and/or suppressed from the operator workstation. The equipment status log shall include the time, equipment name, tag number and the particular change in status.

c. All alarms and events shall be displayed on the display and archived. No alarm or event shall be printed automatically; however, alarms and events shall be available for printing on demand for operator-specified time periods. Alarm information shall consist of point identification number, point name, time of occurrence and type and priority of alarm.

1) All alarms shall be placed in a separate historical file and be easily accessible for use as needed. The PICS shall maintain ninety (90) days of "as logged" raw data and twelve (12) months of partially compressed raw data on the server. The PICS shall recommend the number of additional days or month's data may be retained based on the capacity of the new system.

2) The equipment and point status summary report shall log the status of all points in the system, including contact inputs, real variables with analog inputs and calculated variables. When required this printout will be initiated manually and shall consist of the tag number, tag name and its current status (i.e., Running, Off, High, Low, Active, Disabled, On-scan, Off-scan, etc.).

3) The summary printout shall summarize all alarms for the previous 24-hour period. Normally, this printout shall be initiated manually but provision shall be made so that it may be initiated automatically every day, if desired. The printout shall be generated on-line from stored data. This printout shall consist of all data in the initial alarm occurrence and return to normal, as specified.

4) The current alarm summary printout shall print all points currently in alarm. This printout shall be initiated manually, as required. The printout shall be generated on-line from stored data. This printout shall consist of all points currently in alarm.

5) The capability shall be provided to sort both daily and current alarm summary reports by operator defined groups. (i.e., print all power failure alarms, etc.).

6) The alarm summary printout shall be initiated manually, as required, be generated from stored data on the server and shall consist of the point identification number and the point name.

d. Historical Data Management.

1) The following features shall be provided for processing and storage of system historical data:

a. Data Processing and Storage. The real time instantaneous values shall be stored in a historical log file on the server. The PICS shall maintain ninety (90) days of "as logged" raw data and twelve (12) months of partially compressed raw data on the server. The PICS shall recommend

the number of additional days or month's data may be retained based on the capacity of the new system.

2) Data Archiving. Historical data shall be automatically alarmed and stored on the harddrive. The intent is to ensure that a long-term record of historical information is available to support future studies, etc.

3) Each system point (analog or digital, real or pseudo) shall have the capability of being historically logged. A point shall have the capability of being deleted from the historical log at any time. It shall be easy to add or delete system points using minimal keystrokes.

4) Displays used for historical analysis (such as historical trends, alarms/events summary, etc.) shall have similar capabilities to those used for real time data review. The source of data shall be the HMI's database.

5) The ability to produce ASCII and CSV files which can be used in most of the commercial spreadsheet programs (e.g., Lotus and Excel) and database programs (e.g., Paradox, Oracle, Access) shall be provided.

a) Report Definition.

6) Exact report formats and data to be reported shall be determined by the Owner and be developed by the PICS.

7) Provide for development of (5) custom reports and a minimum of 2 days development time for each.

a) Alarm Notification

8) The existing HMI software is linked to alarm notifications. During start-up, PICS shall coordinate with Owner all new alarms to be monitored and transmitted, and existing alarms transmitted as before the work began.

PART 2 - PRODUCTS

A. The Human Machine Interface shall be the latest version of VTSCADA, or engineer approved.

PART 3 - EXECUTION

3.01 TESTING

A. Refer to Section 25 00 00.

B. In addition to the tests specified in Section 25 00 00, as part of the Site Acceptance Testing (SAT), perform the following:

1. Building and loading the database
2. Conduct online modifications to the database
3. Demonstrate operability of the interfaces (hardware and software)
4. Demonstrate all system software functions specified

C. Demonstrate operability of all process control strategies, graphic screens and reports

D. Verify the displays and all interactive capabilities of the operators workstations

E. Simulate selected operating conditions to verify the performance of the monitoring and control functions

F. Demonstrate the performance of the historical database

G. Demonstrate the performance of the alarm and event logging system

H. Demonstrate the ability to share data between operator workstations

I. Demonstrate the ability of each workstation to print reports and graphic displays

J. Demonstrate the ability for each workstation to read and write to and from designated files from other workstations over the LAN.

END OF SECTION